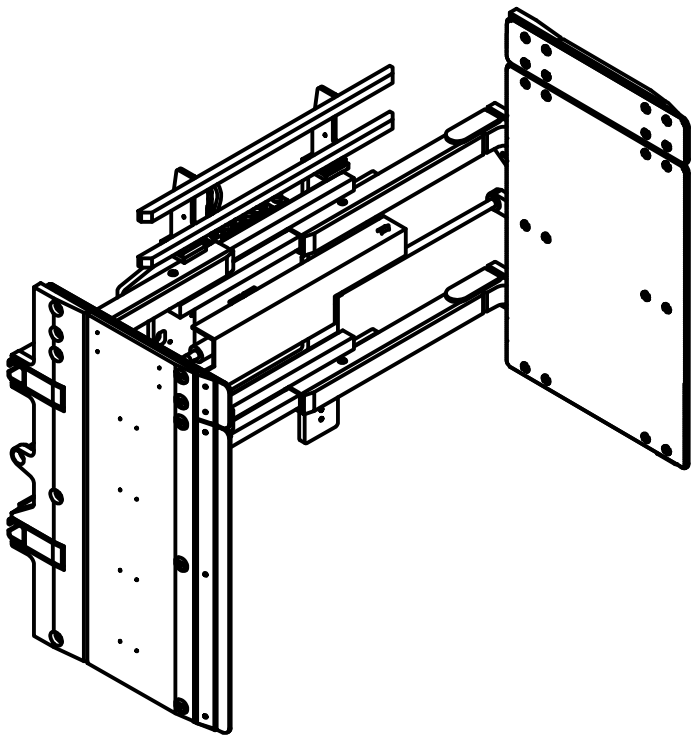
# SERVICE MANUAL / PARTS LIST

## APPLIANCE CLAMP SOFT TOUCH

MODEL #112051

PATENTS PENDING



## CONTENTS:




425 Hazel St.
Kelso WA 98626
(800) 248-6079
Fax (360) 578-9934

# LIFT TRUCK REQUIREMENTS

## CAPACITY

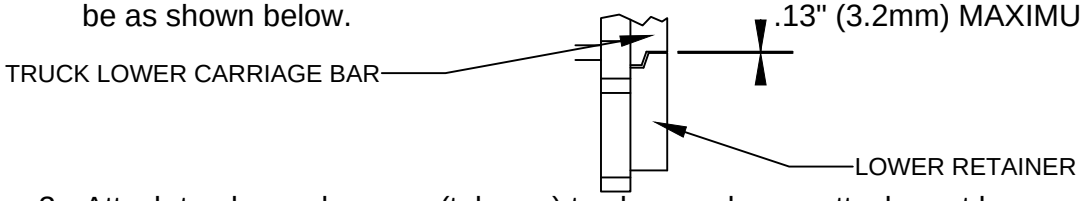
Capacity shown on the Clamp name plate is for the Clamp only. The combined truck and Clamp capacity is provided by the lift truck manufacturer.

## CLAMP HYDRAULICS

**Recommended Truck Pressure:** 2300 to 2500 PSI (159 to 170 bar)
**Hydraulic fluid:** petroleum based hydraulic fluid only
**Hydraulic supply group:** includes hoses and take-up - one set for each function
**Auxiliary valve:**
2 Function (Side Shift & Clamp) = a double auxiliary valve
**Oil Volume Settings:**
Side Shift = 3 GPM
Clamp Open/Close = 7 GPM

# GENERAL INSTALLATION PROCEDURES

1. Make sure that the attachment centering lug is completely seated in truck carriage center notch.
2. Clearance between the lower retainers that hold the attachment to the truck lower carriage bar should be as shown below.




3. Attach truck supply group (take-up) to clamp valve on attachment base.
4. Standing clear of the Clamp attachment cycle the attachment in and out several times. Use caution because partially filled hydraulic lines may cause erratic movement.

# GENERAL INSPECTION AND MAINTENANCE

1. Check all hydraulic fittings, hoses, cylinders and valves for leakages - repair or replace as required

2. Check bladder/water pressure. If out of operating range adjust as required using Loron Pneumatic Fluid Pump #112909. Check clamp force and adjust. (See page 15.)

3. Time Schedule: Check pressure and clamp forces every 3 weeks.
   Water pressure = 4-6 psi  Clamp Force = 1650 lbs centered on bottom pad

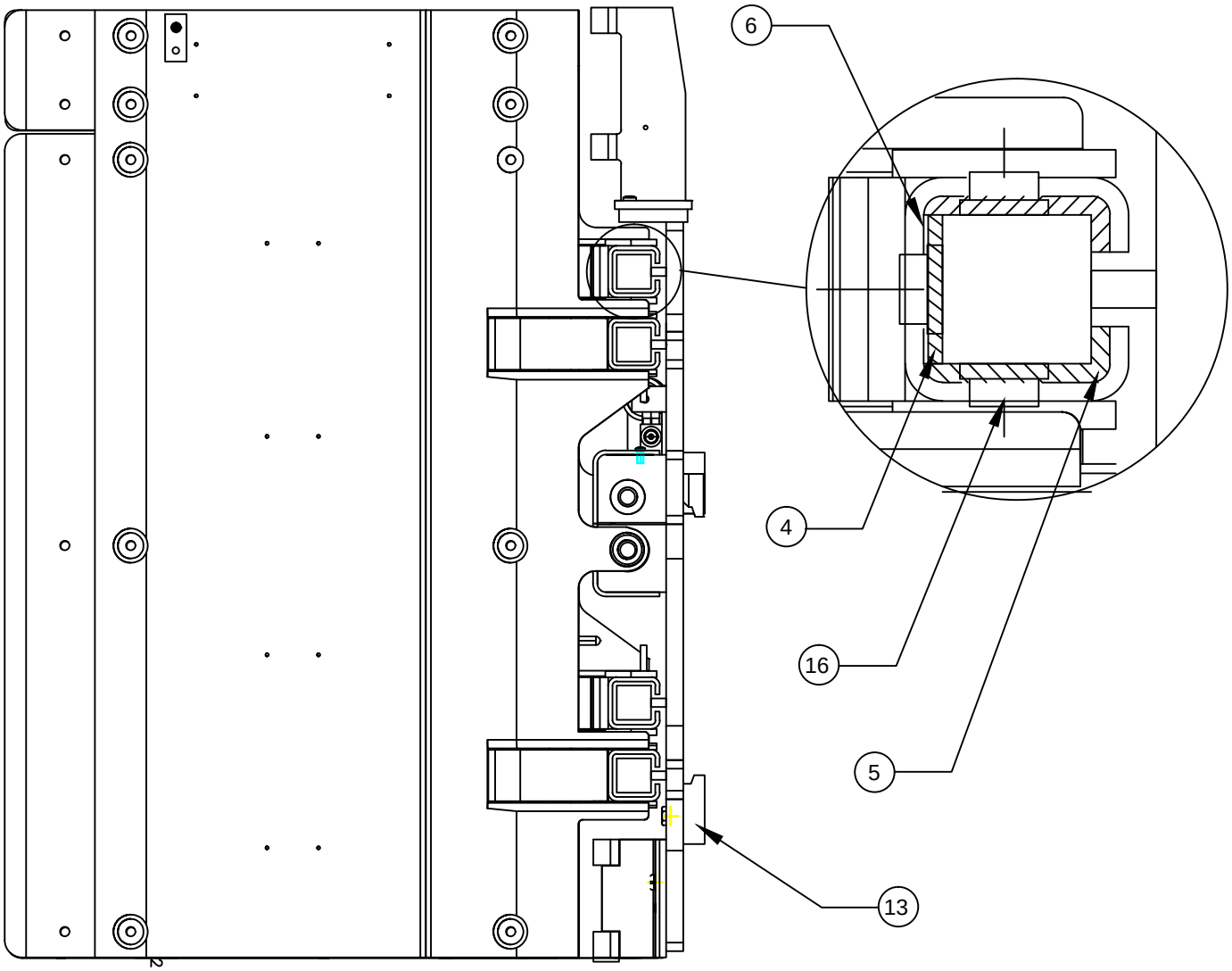
4. All bolts should be checked and tightened as required.

5. Check lower retainer clearance - see item 2 in General Installation Procedures above.

# CLAMP ASSEMBLY - 1

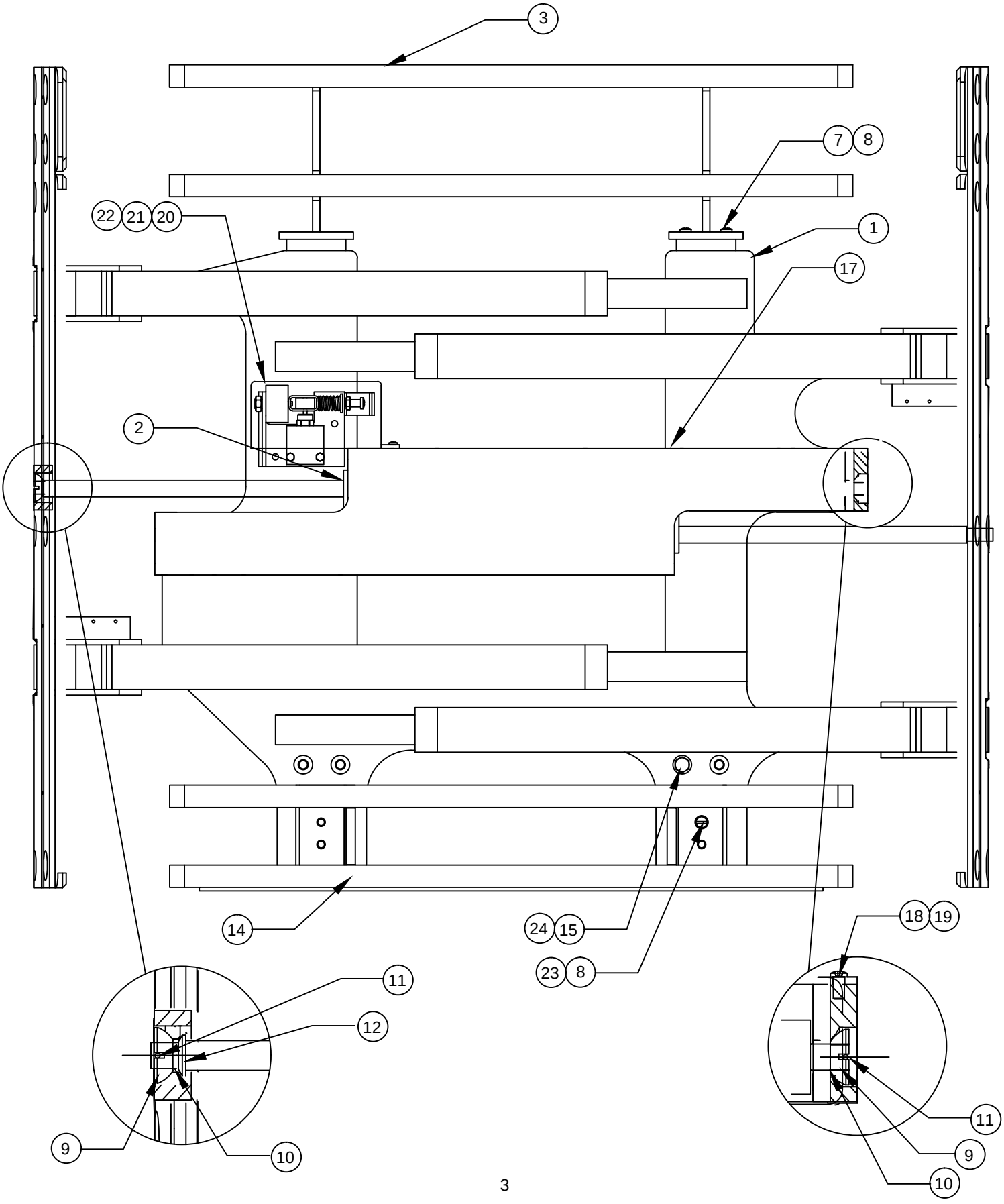
DRAWING REFERENCE 111998.1

| # | QTY | PART # | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 111999 | FRAME |
| 2 | 2 | 111714.1 | CYLINDER ASSEMBLY |
| 3 | 1 | 101448.24 | LOAD BACKREST |
| 4 | 4 | 111622.1 | SLIDE - FLAT |
| 5 | 8 | 111621.1 | SLIDE - ANGLE |
| 6 | 12 | 109212.4 | SHIM |
| 7 | 8 | 1C.0820 | BOLT LSP |
| 8 | 12 | 4E.08 | LOCKWASHER LSP |
| 9 | 4 | 111631 | BEARING SPHERICAL |
| 10 | 4 | 100029.301 | ROD CENTERING SEAL |
| 11 | 4 | 100574.86 | COTTER PIN LSP |
| 12 | 2 | 111380 | CYLINDER ROD WASHER |
| 13 | 2 | 111060 | HOOK LOWER RETAINER II |
| 14 | 1 | 111068 | LOWER LOAD BACKREST |
| 15 | 4 | 1C.1028 | BOLT LSP |
| 16 | 12 | 111619 | SLIDE BUTTON |
| 17 | 1 | 111861 | CYLINDER GUARD |
| 18 | 4 | 25G.0608 | BOLT LSP |
| 19 | 4 | 2F.06 | WASHER LSP |
| 20 | 1 | 111367 | COVER WELDMENT |
| 21 | 2 | 25G.0512 | BOLT LSP |
| 22 | 2 | 4E.05 | LOCKWASHER LSP |
| 23 | 4 | 1C.0828 | BOLT LSP |
| 24 | 4 | 4E.10 | LOCKWASHER LSP |



# CLAMP ASSEMBLY - 2

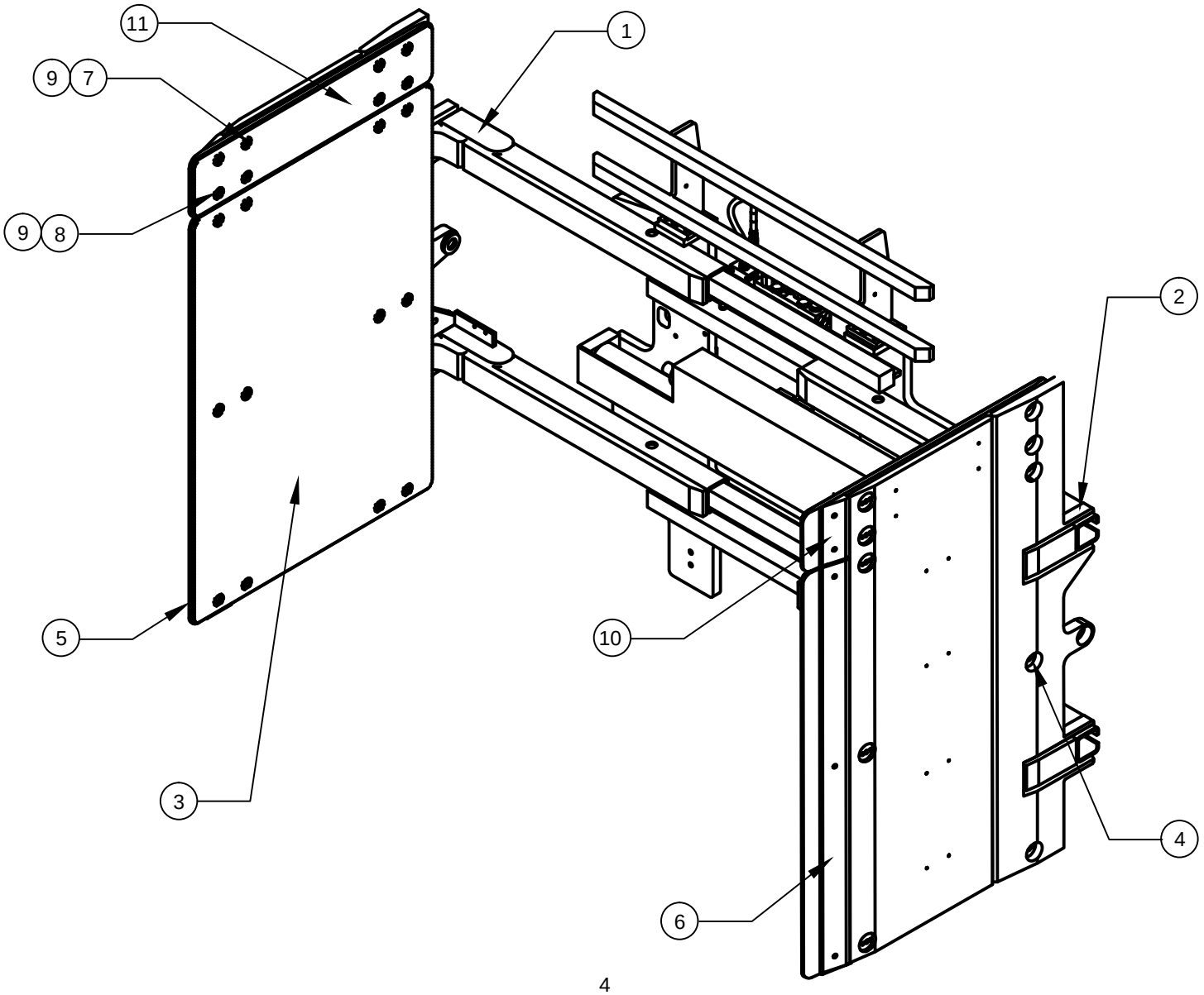
DRAWING REFERENCE 111998.1



# ARM GROUP ASSEMBLY

DRAWING REFERENCE 111164.3

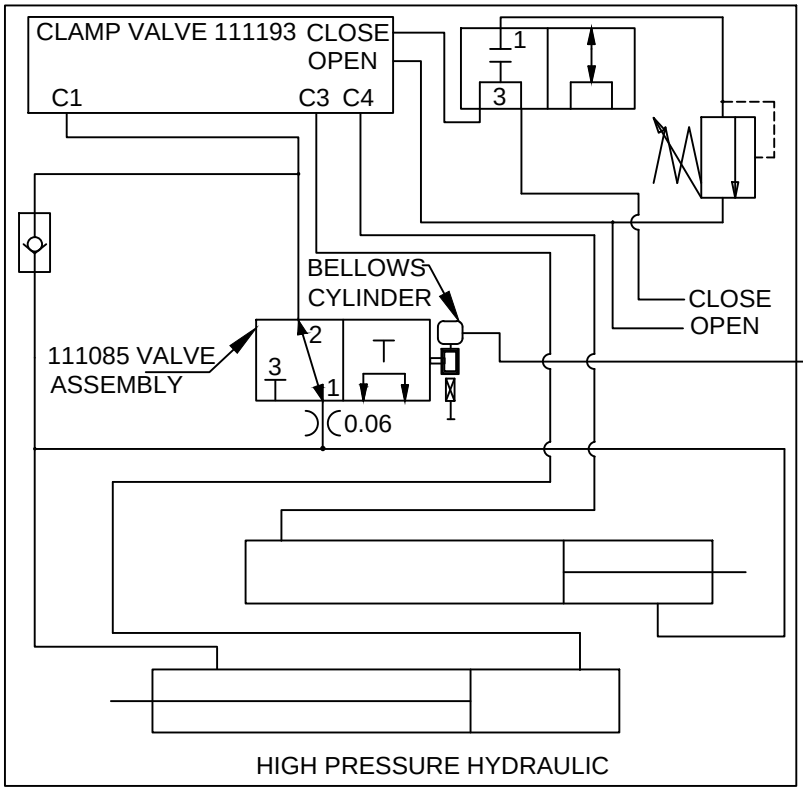
| # | QTY | PART # | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 111722 | ARM WELDMENT RIGHT HAND |
| 2 | 1 | 111724 | ARM WELDMENT LEFT HAND |
| 3 | 2 | 111209 | CONTACT PAD (LOWER) |
| 4 | 20 | 111031 | RETAINING NUT |
| 5 | 1 | 111216 | TIP PLATE WELDMENT RIGHT HAND |
| 6 | 1 | 111218 | TIP PLATE WELDMENT LEFT HAND |
| 7 | 20 | 1C.0820 | BOLT LSP |
| 8 | 10 | 1C.0812 | BOLT LSP |
| 9 | 30 | 108088 | SPRING WASHER |
| 10 | 2 | 112057 | TIP PLATE UPPER |
| 11 | 2 | 111210 | CONTACT PACT (UPPER) |



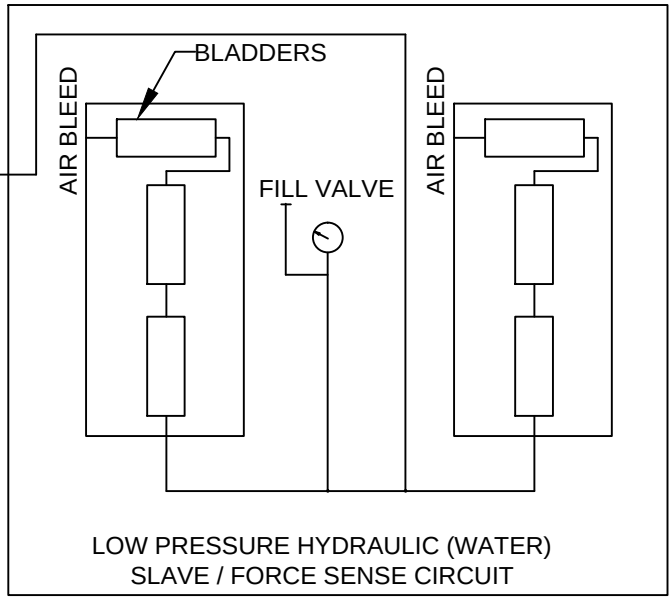
# BLADDER HYDRAULIC ASSEMBLY - 1

DRAWING REFERENCE 111288.1

| # | QTY | PART# | DESCRIPTION |
|---|---|---|---|
| 1 | 3 | 111350 | AIR TANK VALVE |
| 2 | 9 | 111295 | HOSE CLAMP |
| 3 | 1 | 111290.0025 | HOSE |
| 4 | 1 | 111296 | PRESSURE GAUGE |
| 5 | 1 | 111543.01 | 90° ELBOW FITTING |
| 6 | 1 | 111292 | BRANCH TEE |
| 7 | 1 | 111290.0175 | HOSE |
| 8 | 1 | 111293 | RUN TEE |
| 9 | 1 | 111290.0060 | HOSE |
| 10 | 1 | 111290.0155 | HOSE |
| 11 | 1 | 111290.1210 | HOSE |
| 12 | 1 | 111290.1185 | HOSE |
| 13 | 1 | 111299 | HOSE CLIP |
| 14 | 1 | 25G.0516 | BOLT LSP |
| 15 | 6 | 111030 | BLADDER |
| 16 | 2 | 111290.0094 | HOSE |
| 17 | 2 | 111290.0166 | HOSE |
| 18 | 2 | 111290.0114 | PRESSURE GAUGE |
| 19 | 24 | 9G.0412 | BOLT LSP |
| 20 | 12 | 111471 | CLAMP BAR |
| 21 | 8 | 109256 | HOSE CLAMP |
| 22 | 8 | 25G.0508 | BOLT LSP |
| 23 | 2 | 113026.0360 | COVER HOSE |
| 24 | 4 | 111128 | HOSE GUIDE |
| 25 | 12 | 25G.0512 | BOLT LSP |
| 26 | 1 | 111085.1 | CLAMP FORCE CONTROL VALVE - REFERENCE - |
| 27 | 1 | 111289 | PIPE ELBOW |
| 28 | 2 | 111510 | SPRING |
| 29 | 24 | 111878 | 19. GA STAINLESS STEEL WIRE TIE |
| 30 | 1 | 112123 | HOSE CLAMP |
| 31 | 1 | 25G.0608 | BUTTON HEAD BOLT LSP |



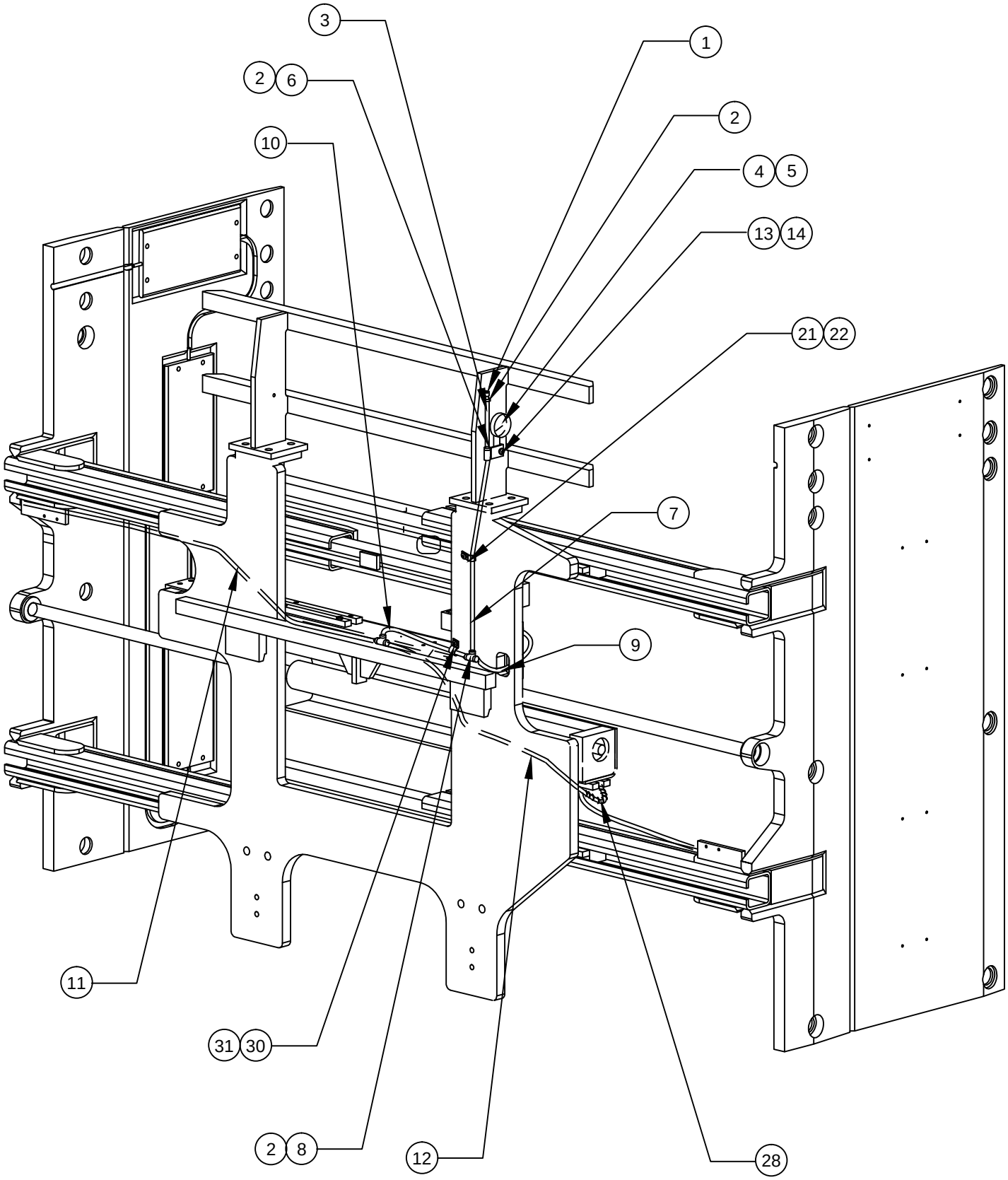
HIGH PRESSURE HYDRAULIC



LOW PRESSURE HYDRAULIC (WATER)
SLAVE / FORCE SENSE CIRCUIT

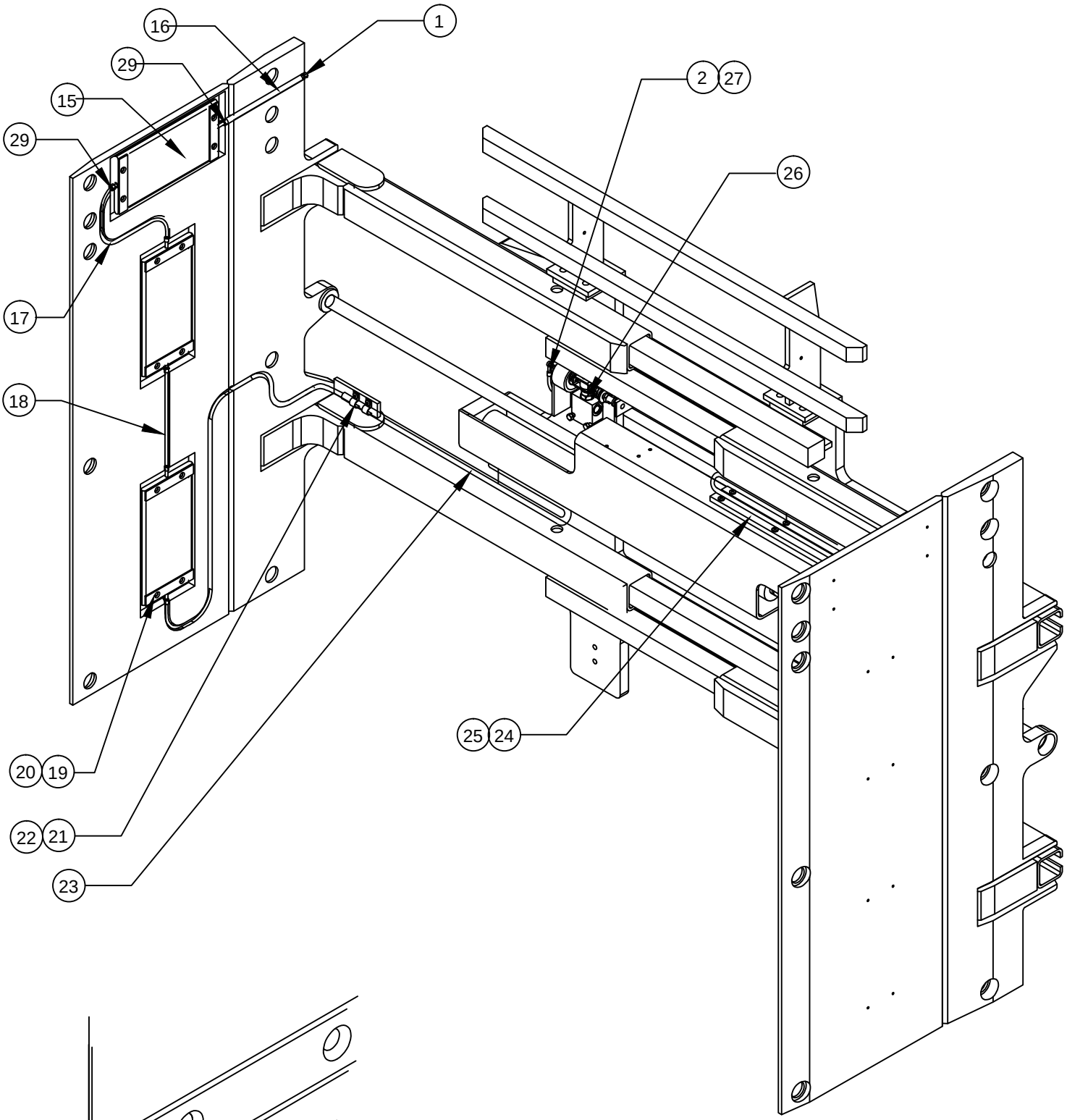
# BLADDER HYDRAULIC ASSEMBLY - 2

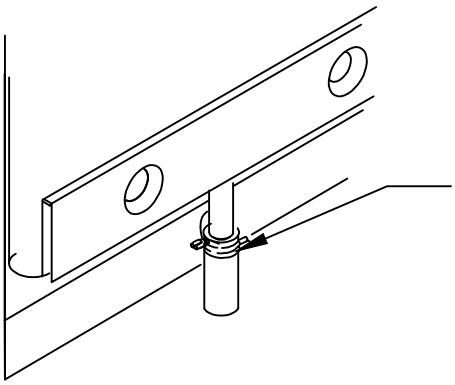
DRAWING REFERENCE 111288.1



# BLADDER HYDRAULIC ASSEMBLY - 3

DRAWING REFERENCE 111288.1



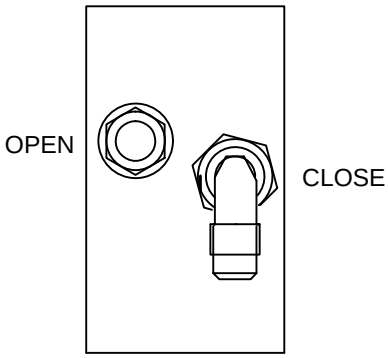



NOTE:
USE TWO 19 GAUGE STAINLESS STEEL WIRE TIES (111878) AT EACH BLADDER CONNECTION - TWIST TO TIGHTEN AND CLIP TO REDUCE ENDS.

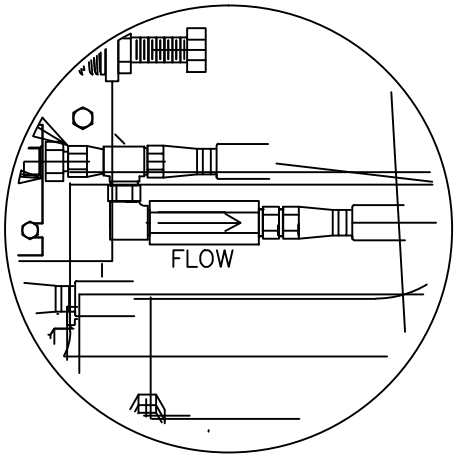
# HYDRAULIC ASSEMBLY - 1

DRAWING REFERENCE 112119

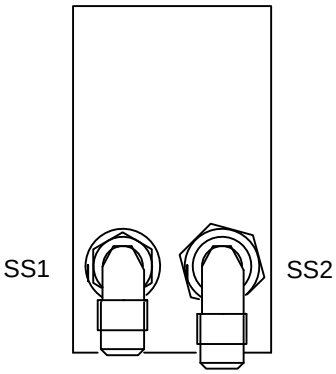
| # | QTY | PART # | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 111193 | CLAMP VALVE |
| 2 | 2 | 25G.0524 | BUTTON HEAD BOLT |
| 3 | 3 | 100676.05 | STRAIGHT THREAD ADAPT - O-RING #6-6 |
| 4 | 1 | 100674.0155 | HOSE ASSEMBLE 06-06-06 |
| 5 | 1 | 111085.1 | DIRECTIONAL VALVE ASSEMBLY |
| 6 | 1 | 100232.05 | SWIVEL RUN TEE FITTING #6 |
| 7 | 1 | 111073.05 | STRAIGHT THREAD ADAPT ELL PIPE TO SWIVEL |
| 8 | 1 | 111123 | IN-LINE CHECK VALVE |
| 9 | 1 | 100432.05 | MALE ADAPT JIC 06 / MALE PIPE 1/4-18 |
| 10 | 1 | 100674.0255 | HOSE ASSEMBLE 06-06-06 |
| 11 | 1 | 100678.05 | O-RING TEE BRANCH FITTING |
| 12 | 2 | 100440.05 | 90° FITTING-SWIVEL JIC |
| 13 | 1 | 100674.0340 | HOSE ASSEMBLE 06-06-06 |
| 14 | 1 | 100674.0275 | HOSE ASSEMBLE 06-06-06 |
| 15 | 3 | 100095.05 | 90° FITTING-SWIVEL #6 O-RING ELL |
| 16 | 1 | 100674.0370 | HOSE ASSEMBLE 06-06-06 |
| 17 | 1 | 100674.0190 | HOSE ASSEMBLY 06-06-06 |
| 18 | 1 | 100222 | O-RING RESISTOR |
| 19 | 2 | 109528 | LOCK WASHER |
| 20 | 1 | 25G.0612 | BOLT BUTTON HEAD |
| 21 | 1 | 25G.0608 | BOLT BUTTON HEAD |
| 22 | 1 | MCD 0190-3.00 | BAR FLAT |




RIGHT END VIEW



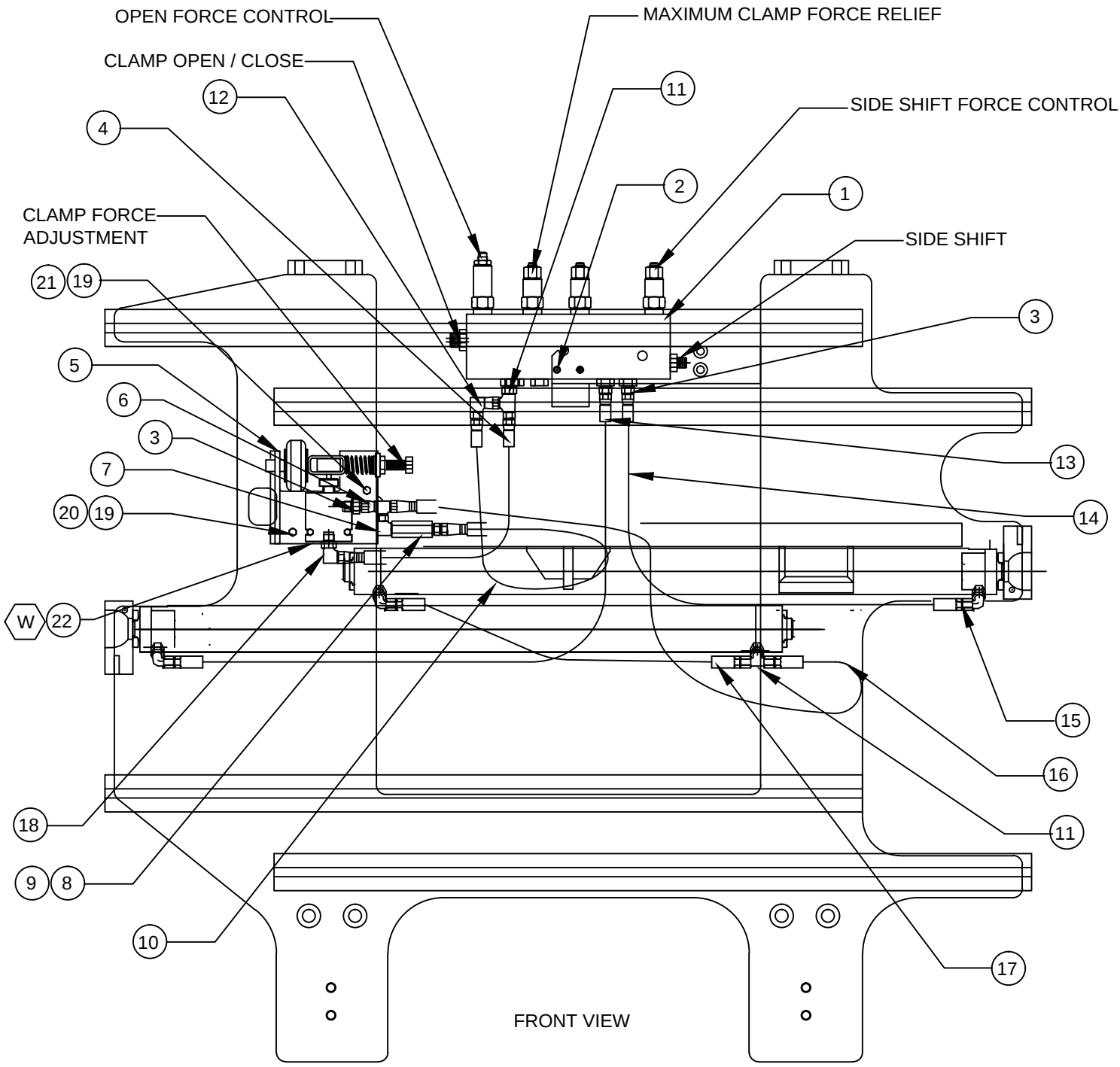

FLOW DETAIL




LEFT END VIEW

# HYDRAULIC ASSEMBLY - 2

DRAWING REFERENCE 112119



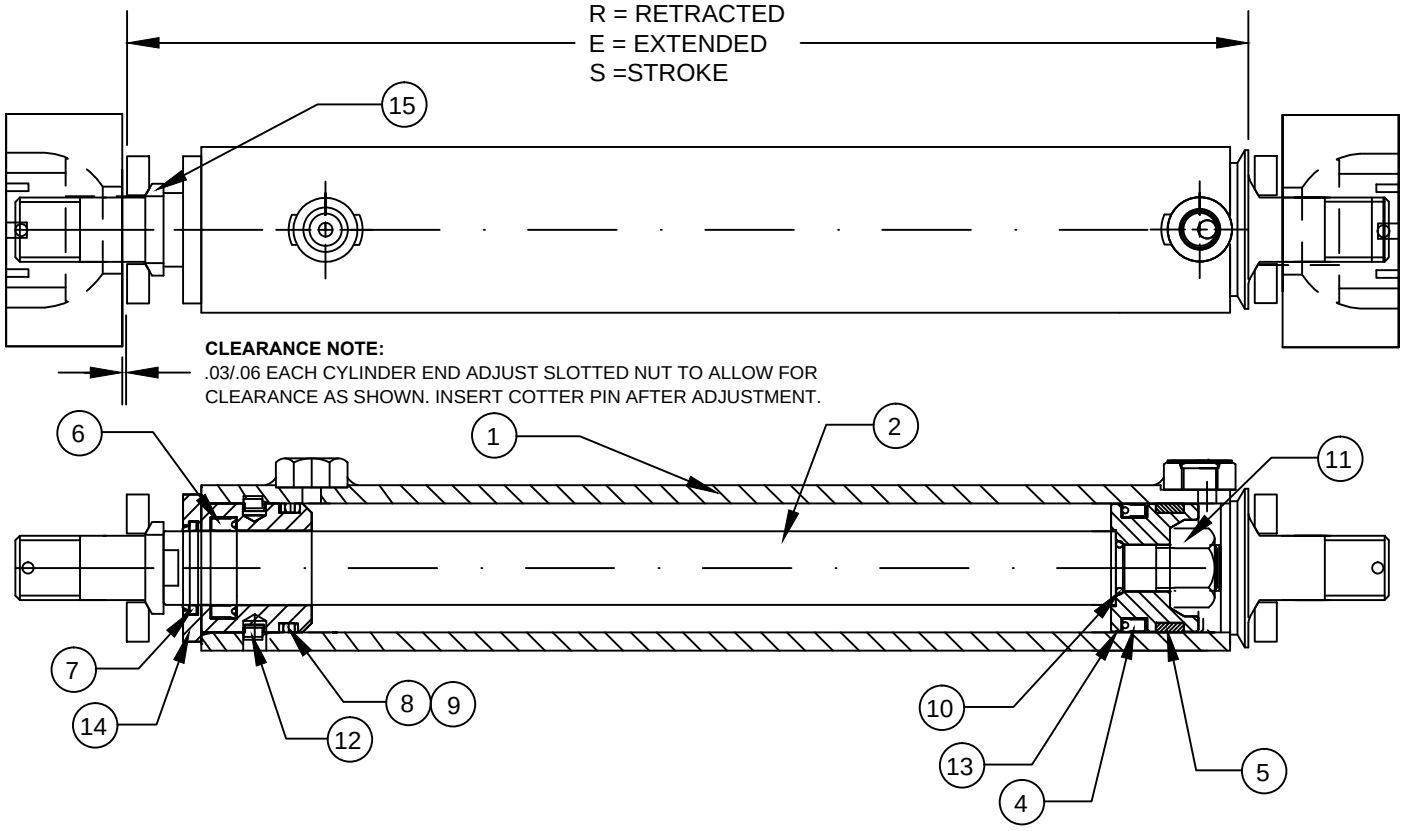

W TACK IN PLACE TO LOCK VALVE ASSEMBLY

# CYLINDER ASSEMBLY

DRAWING REFERENCE 111714.1

| PART # | R | E | S | NET STROKE |
|---|---|---|---|---|
| 111714.1 | 35.08 | 66.16 | 31.08 | 31.08 |

| # | QTY | PART # | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 111715.1 | TUBE WELDMENT |
| 2 | 1 | 111717.1 | ROD |
| 3 | 1 | 111482 | SEAL KITS (NOT SHOWN) |
| 4 | 1 | 100032.6 | POLY-PAK "B" LSP |
| 5 | 1 | 102099.1 | WEAR RING LSP |
| 6 | 1 | 100031.7 | POLY-PAK LSP |
| 7 | 1 | 102098.5 | ROD WIPER LSP |
| 8 | 1 | 100029.2 | "O" RING LSP |
| 9 | 1 | 100028.2 | BACK-UP RING LSP |
| 10 | 1 | 100029.201 | "O" RING LSP |
| 11 | 1 | 27D.10 | NUT SELF LOCKING LSP |
| 12 | 1 | 100027.7 | LOCKWIRE LSP |
| 13 | 1 | 111374 | PISTON |
| 14 | 1 | 111373 | GLAND |
| REF. | | | |
| 15 | 1 | 111380 | CYLINDER WASHER |

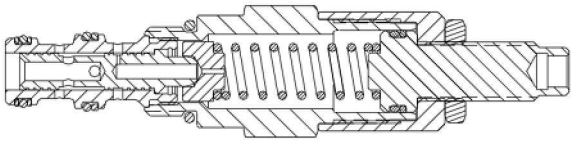



## CYLINDER SERVICE

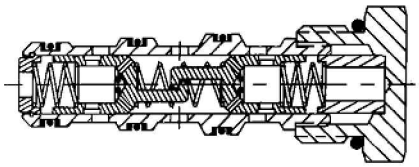
- Prior to assembly lubricate seals, cylinder bore and rod with STP.
- Inspect all parts for scratches, nicks and gouges- -replace all damaged components.
- Inspect cylinder bore and rod for scoring- -replace if scored
- Avoid damage to seal grooves- -use a dull screwdriver for seal removal
- Torque piston nut to 110 FT/LBS. (15.3 kg-m)

# CONTROL VALVE

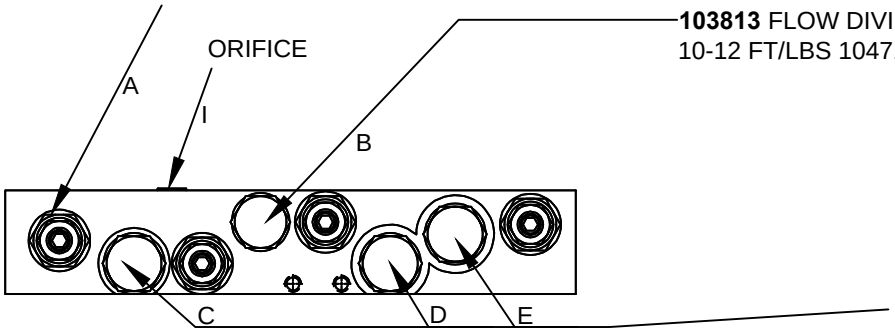
DRAWING REFERENCE 111193

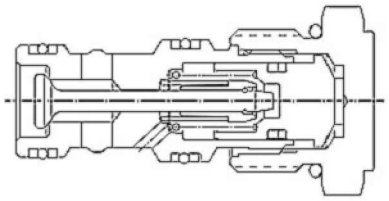


**111627** REDUCE/REL. VALVE TORQUE 15-20 FT/LBS
SEAL KIT 112065

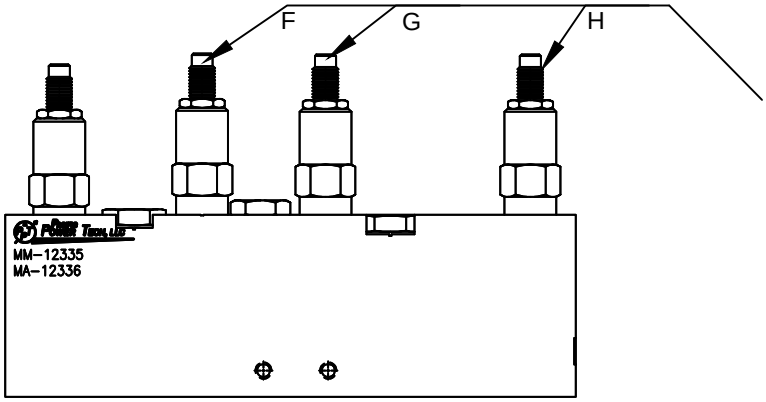


**103813** FLOW DIVIDER TORQUE
10-12 FT/LBS 104711 SEAL KIT

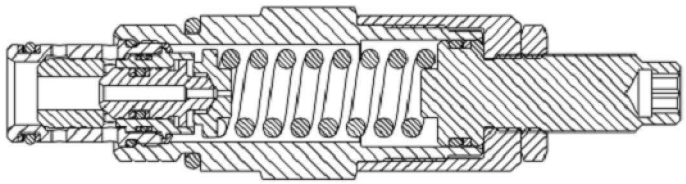


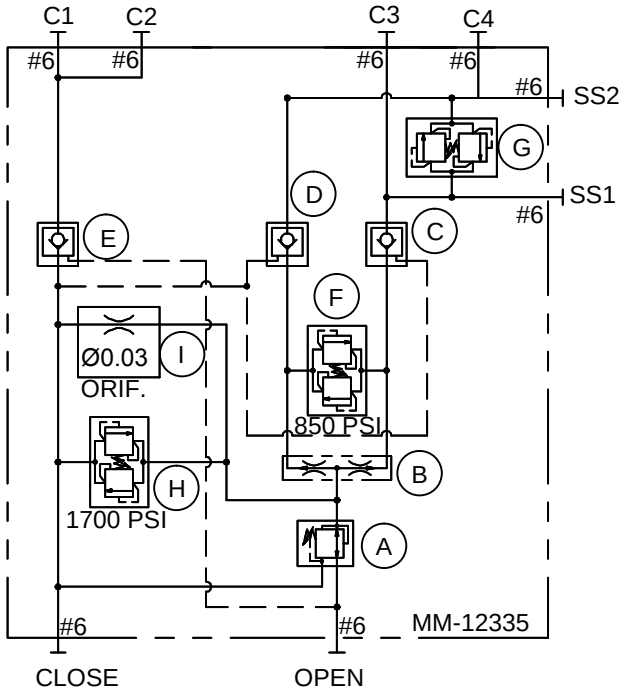
**111244** CHECK VALVE TORQUE
30-35 FT/LBS SEAL KIT 112059




**112406.1 & 112406.2**(G) RELIEF TORQUE
20-25 FT/LBS SEAL KIT 112064



## HYDRAULIC SCHEMATIC



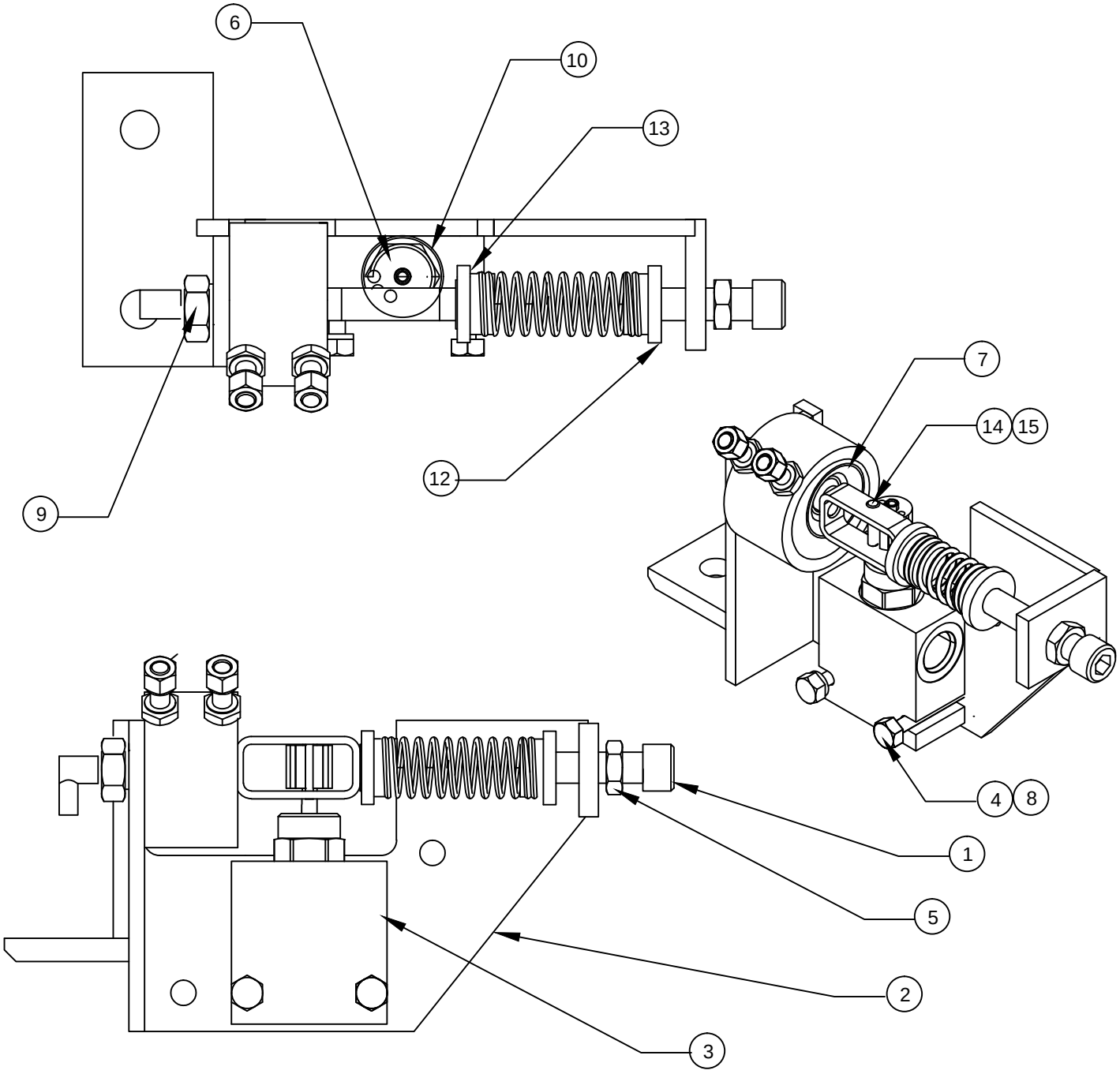

**NOTE:**
1. Lubricate threads & seals prior to assembly.

| QTY | PART # | DESCRIPTION |
|---|---|---|
| 1 | 111627 | PRESSURE REDUCE / RELIEF VALVE |
| 1 | 103813 | FLOW DIVIDER |
| 1 | 112406.2 | BI-DIRECTIONAL RELIEF VALVE |
| 2 | 112406.1 | RELIEF VALVE |
| 3 | 111244 | P.O. CHECK CARTRIDGES |

# CLAMP FORCE CONTROL VALVE

DRAWING REFERENCE 111085.1

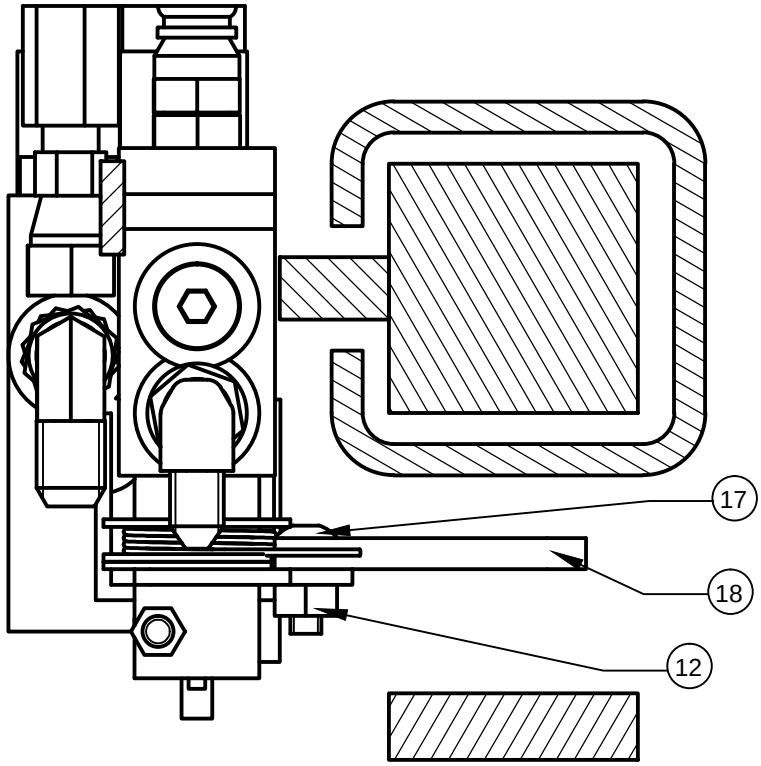
| # | QTY | PART # | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 11G.0844 | BOLT |
| 2 | 1 | 111092 | MOUNTING PLATE WELDMENT |
| 3 | 1 | 111094 | DIRECTIONAL |
| 4 | 2 | 4E.04 | LOCKWASHER |
| 5 | 1 | 7D.08 | JAM NUT |
| 6 | 1 | 110906 | WHEEL |
| 7 | 1 | 111091 | AIR SPRING |
| 8 | 2 | 1C.0424 | BOLT |
| 9 | 1 | 1D.10 | HEX NUT |
| 10 | 1 | 111328 | WHEEL HOUSING |
| 11 | 1 | 111097 | SPRING |
| 12 | 1 | 111098 | SPRING TENSION CAP |
| 13 | 1 | 111572 | SPRING CAP |
| 14 | 1 | 111655 | CLEVIS PIN |
| 15 | 1 | 100574.28 | COTTER PIN |



# NARROW RANGE FORCE CONTROL - 1

DRAWING REFERENCE 111761

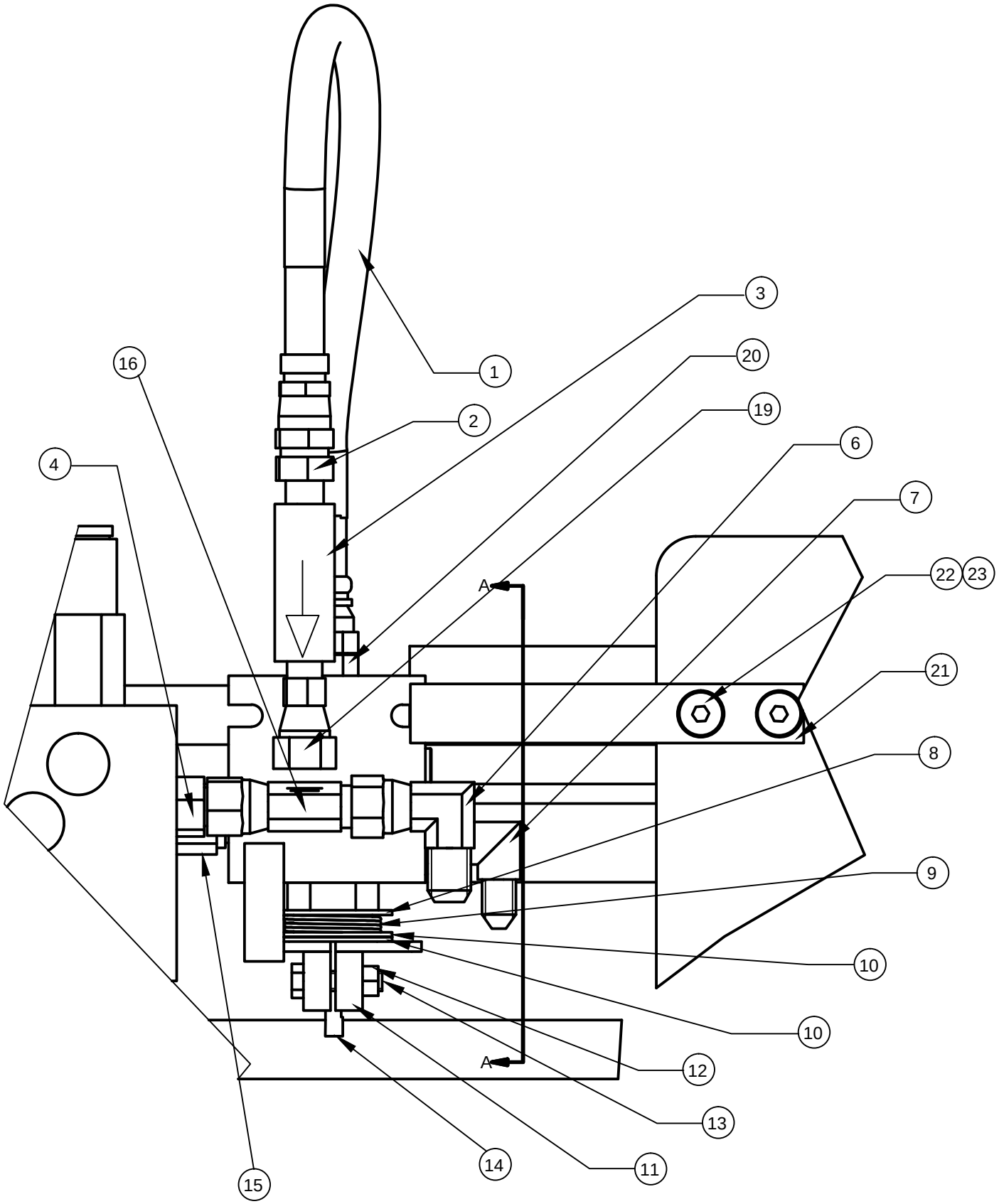
| # | QTY | PART # | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 100233.0145 | HOSE ASSEMBLY 06/04/06 |
| 2 | 1 | 100432.05 | FTG MALE ADAPTER JIC/PIPE -06 JIC/1/4 - 18 |
| 3 | 1 | 112049 | RELIEF VALVE |
| 4 | 1 | 100676.05 | FITTING STRAIGHT THREAD O-RING ADAPTER |
| 5 | 1 | 111775 | VALVE BODY MODIFIED |
| 6 | 1 | 100440.05 | SWIVEL NUT ELBOW |
| 7 | 1 | 100095.05 | FITTING 90 DEG O-RING ELBOW |
| 8 | 1 | 111756 | BRONZE WASHER HOLE |
| 9 | 1 | 111766 | MODIFIED TORSION SPRING |
| 10 | 2 | 111757 | FLAT BRONZE WASHER |
| 11 | 1 | 111647 | BRACKET WELDMENT |
| 12 | 2 | 17D.04 | NUT NYLOCK .25 NC PLATTED |
| 13 | 1 | 1C.0416 | BOLT .25 X 1 NC GR5 HEX BOLT PLATED |
| 14 | 1 | 111760 | DIRECTIONAL VALVE CARTRIDGE |
| 15 | 1 | 105633 | FITTING MALE CONNECTOR #6 O-RING - #6 O-RING |
| 16 | 1 | 100232.05 | FITTING - SWIVEL NUT RUN TREE |
| 17 | 1 | 25G.0412 | BOLT .25 X .75 NC BUTTON HEAD CAP CREW |
| 18 | 1 | 111636 | ACTUATOR ARM |
| 19 | 1 | 111518.06 | FITTING STRAIGHT THREAD ADAPT SWIVEL FEMALE 1/4 PIPE / -06 37^ FLARE |
| 20 | 1 | 111764 | STRAIGHT THREAD ADAPTER |
| 21 | 1 | 112124 | STOP BAR |
| 22 | 2 | 4E.05 | LOCK WASHER |
| 23 | 2 | 25G.0508 | BUTTON HEAD BOLT |




DETAIL A-A

# NARROW RANGE FORCE CONTROL - 2

DRAWING REFERENCE 111761



# CLAMP ADJUSTMENTS

## CLAMP FORCE CHECK/ADJUSTMENT

1) Check water pressure. If out of operating range fill with Loron Pneumatic Fluid pump # 112909. Note: when operating in below freezing temperatures us RV antifreeze in place of water.

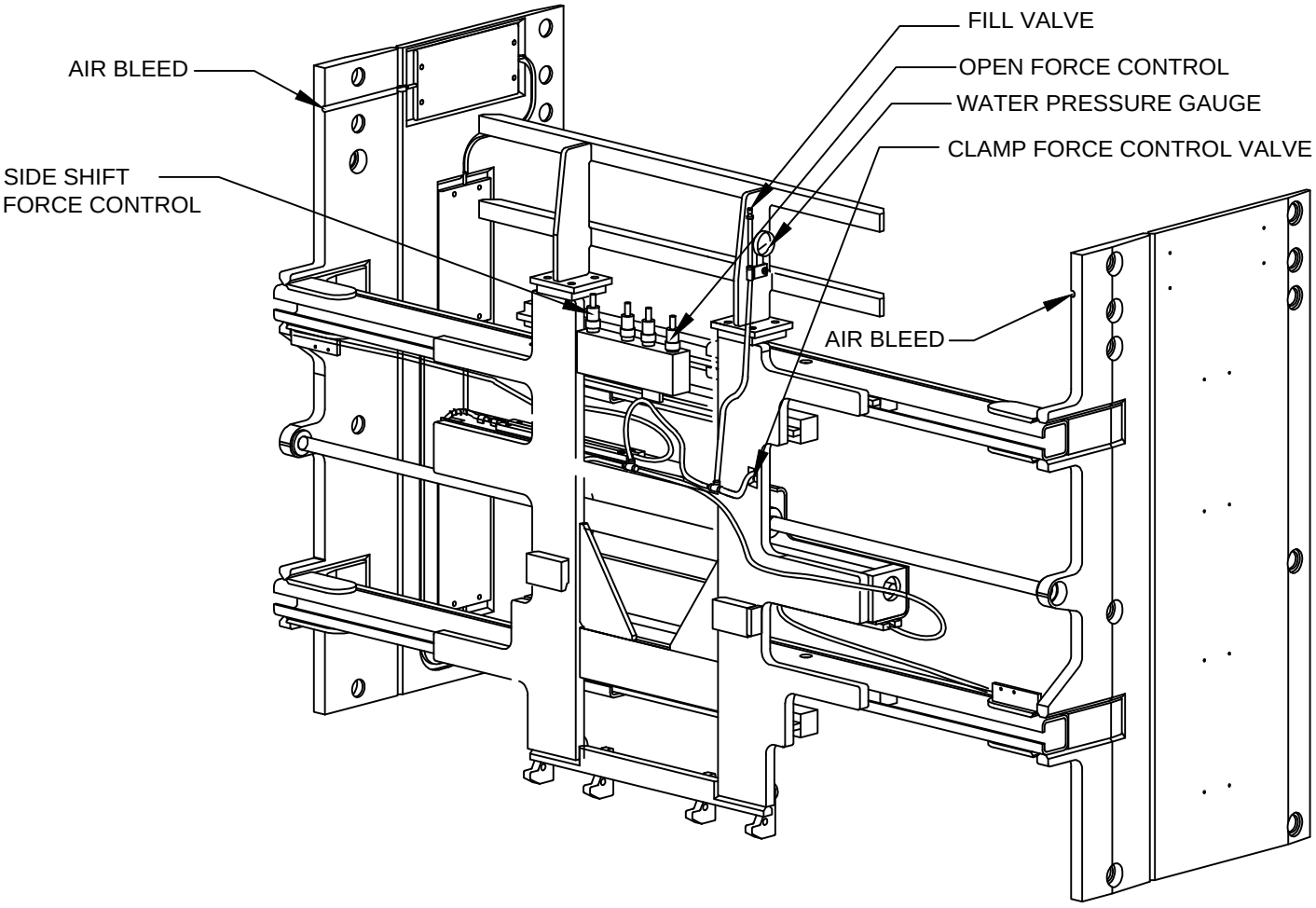
2) Check the clamp force. Centered on bottom pad.

## OPEN FORCE CHECK/ADJUSTMENT

Open the arms against a force fixture and adjust for desired maximum force.

## SIDE SHIFT FORCE ADJUSTMENT

1) Clamp on the heaviest load that will be handled
2) Adjust the side shift force down until the arms stop
3) Turn the adjusting screw one turn in.



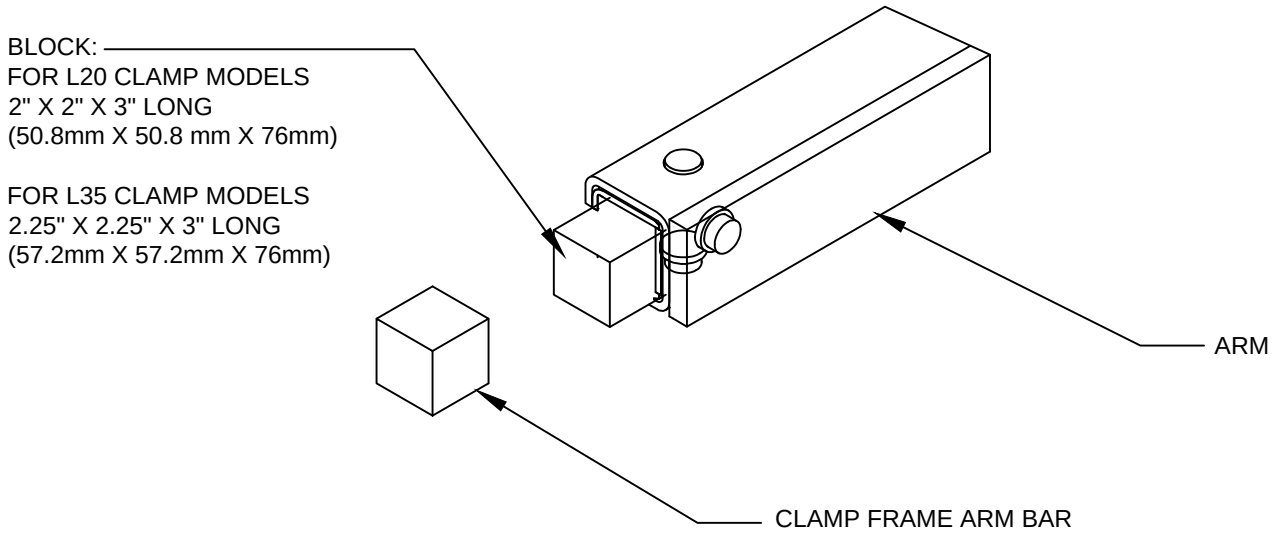
# ARM SLIDE & SHIM REPLACEMENT

1. To replace the slides extend the arms to the fully open position. Release system pressure prior to removing the arms by turning the truck off and working the side shift and clamp function controls several times.

2. Support the arm with an overhead crane or lift truck. Be sure to secure the chain or sling in a manner that prevents the arm from falling out of the chain or sling when hanging free of the clamp frame.

3. Remove the cotter pin, slotted nut and spherical bearing from the end of the clamp cylinder rod. Keeping hands and feet clear, carefully slide the clamp arm off of the clamp frame.

4. Install the arm on the clamp frame ensuring that the arm moves freely without excessive binding. If the arm is too loose or too tight add or remove shims as required. Once the clearance is satisfactory insert the cylinder rod into the cylinder anchor on the arm. Install the spherical bearing, nut and cotter pin onto the cylinder rod end. Be sure to leave .03" - .06" (.7mm to 1.5mm) clearance to allow the cylinder to "float" on it's mountings (see page 10).Remove the cotter pin, slotted nut and spherical bearing from the end of the clamp cylinder rod. Keeping hands and feet clear, carefully slide the clamp arm off of the clamp frame.




5. Inspect slides and slide buttons for wear. Slides may be rotated end-for-end and re-used if excessively worn on the outer end only. Extra shims may be used to tighten operating clearance on slightly worn slides. Replace any slides worn to less than .06" (1.5mm) thick or any slide that is deeply scored or broken.

6. To aid in replacing the slides a block may be fashioned of wood or another convenient material to the dimensions shown above. The block is inserted in the end of the arm to hold the slides, shims and buttons in position while the arm is inserted over the arm bars on the clamp frame. The block is expelled out the opposite end of the arm as the arm is pushed onto the frame.

7. Prior to installing the arm the block may be used to determine the number of shims to place under the slides. Adjust the clearance between the slides and the block to provide approximately .06" (1.5mm) running clearance between the slides and arm when installed.

# TROUBLE SHOOTING GUIDE

## *LOADS SLIPPING OR DROPPING*

| POSSIBLE CAUSES | SOLUTIONS |
|---|---|
| 1. Clamp force set too low | Adjust clamp force page 15 |
| 2. Internal leakage in cylinder. | 1. Replace cylinder seals. If tube, piston or rod is scored replace with new parts. |
| 3. Load too heavy for the clamp capacity | 2. Consult factory. |
| 4. Load my not by stacked correctly or may need to be unitzed | 3. Restack or unitize load (shrink wrap) |
| 5. Bent arms or contact pads | 4. Consult factory. |
| 6. Damaged / leaking hydraulic hose | 5. Replace damaged hose |

## *CRUSHING LOADS*

| POSSIBLE CAUSES | SOLUTIONS |
|---|---|
| 1. Clamp force set too high | 1. Adjusting clamp force, page 15 |
| 2. Bent arms or contact pads | 2. Consult factory |
| 3. Leak in bladder system | 3. Check for leaks and repair. |

## *ARM CHATTERING OR ERRATIC MOVEMENT*

| POSSIBLE CAUSES | SOLUTIONS |
|---|---|
| 1. Bent clamp arms | 1. Consult factory |
| 2. Nylon slides sticking<br>Note: Sticking slides can cause inconsistent clamp force measurements | 2. Clean slides if necessary, the slides are self lubricating. |
| 3. Nylon slides worn, broken or missing. | 3. Replace damaged slides, shims and retaining buttons. |